discussed below, the rejection is traversed insofar as it is applied to the amended independent claims 1, 7, 13 and 18.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *MPEP 2143.03.* Both Rubin and Furutani fail to teach or suggest a biasing circuit in which there is an active element that, during its operation, maintains a relatively low output impedance over a bandwidth comparable to the amplitude modulation bandwidth of a RF input signal. On *page 2* of the current Office Action, the Examiner is relying on *Col. 2, line 59* of Rubin for the disclosure of a biasing circuit having an operational amplifier as the active element "6" which has a relatively low output impedance. Assuming *arguendo* that the operational amplifier is equivalent to the active element of the present inventive biasing circuit, this operational amplifier does not maintain a low output impedance during its operation. More specifically, the operational amplifier of Rubin has a low output impedance during small signal operation and a high output impedance during high signal operation. *Rubin, Col. 1, line 63 through Col. 2, line 5.* In other words, the magnitude of the impedance output of Rubin's operational amplifier varies from low to high as the magnitude of the input signal changes from low to high. The reasons are "for small signals it is desirable to have a bias supply which is stable, temperature compensated, and of *low impedance*" and "[f]or large signal operation it is desirable to have *high impedance* bias network." *Rubin, Col. 1, lines 45-47 and 52-53* (emphasis added). Rubin simply does not teach or suggest maintaining a relatively low output impedance since the impedance of Rubin's bias circuit varies as the amplitude of the input signal changes. Furthermore, even assuming *arguendo* that Rubin's bias circuit does maintain a relatively low output impedance, Rubin still fails to teach or disclose maintaining such relatively low output impedance over a bandwidth comparable to the amplitude modulation bandwidth of the RF input signal. Accordingly, the cited prior art references fail to teach or suggest the claimed invention.

Based on the above discussion, independent claims 1, 7, 13 and 18 and their respective dependent claims 2, 4-6, 8, 10-12, 14, 16-17 and 20 are believed to be non-obvious and patentably distinguishable over Rubin in view of Furutani.

Claims 3, 9, 15 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rubin in view of Furutani and further in view of Jacob Millman, *Microelectronics: Digital and Analog Circuits and Systems* (1979) ("Millman").

Claims 3, 9, 15 and 19 depend on independent claims 1, 7, 13 and 18, respectively, which are believed to be allowable as discussed above. Accordingly, dependent claims 3, 9, 15 and 19 are also believed to be non-obvious and patentably distinguishable over Rubin in view of Furutani and further in view of Millman.

Claims 1-20 are presently standing in the application. Each and every point raised in the Office Action mailed on September 24, 2002 has been addressed on the basis of the above remarks. Reconsideration and withdrawal of the rejections are respectfully requested. However, should the Examiner believe that direct contact with the Applicants' attorney would advance the prosecution of the application, the Examiner is invited to telephone the undersigned at the number given below.

Respectfully submitted,

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CERTIFICATE OF MAILING

I HEREBY CERTIFY THAT THIS DOCUMENT IS BEING DEPOSITED WITH THE UNITED STATE POSTAL SERVICE, ON THE DATE INDICATED, AS FIRST CLASS MAIL, POSTAGE PREPAID, IN AN ENVELOPE ADDRESSED TO: **COMMISSIONER FOR PATENTS, BOX NON FEE AMENDMENT, WASHINGTON, D.C. 20231**

Signature: Edward Bennett

Date: 12/18/02

AMENDMENTS WITH VERSION MARKINGS

IN THE SPECIFICATION

The op amp 155 preferably has high internal impedance at its two input terminals so that negligible current flows into the negative input terminal from the voltage bias source 135. That way, almost all of the current passing through resistor 160 from the voltage bias source 135 also flows through resistors 165 and 130. In addition, the op amp 155, preferably, has a relative low output impedance and a high gain. The arrangement of resistor 160 ("R1"), resistor 165 ("R2"), and the op amp 155 forms an inverting amplifier circuit having an output voltage, V_{out} approximately equal to

$$V_{out} = -(R2/R1)*V_{bias}$$

where V_{bias} is the voltage of the voltage bias source 135. This approximation is good when the gain of the op amp 155 is a few orders of magnitude larger than R2/R1. When negligible current flows through the resistor 130, the gate bias voltage at the gate of transistor 115 is approximately equal to the output voltage V_{out} of the active element circuit 140. The [actial] actual value of resistors 160 and 165 are dependent on the desired operating characteristics of the amplifier circuit 110. For example, when resistors 160 and 165 have equal resistance, a gate voltage bias of -1.5 V can be achieved by using a voltage bias V_{bias} of 1.5 V.

IN THE CLAIMS

1. (Amended) A biasing circuit for biasing a device used for amplifying a radio frequency (RF) signal, the RF signal comprising an amplitude modulated carrier having an amplitude modulation bandwidth, the biasing circuit comprising:

an active element having an input and an output, wherein during its operation the active element [having]maintains a relatively low output impedance over a bandwidth comparable to the amplitude modulation bandwidth; and

a resistor having an input connected to the active element output, wherein a direct current (DC) bias voltage applied at the active element input produces a fixed DC voltage at the resistor input.

7. (Amended) An amplifier circuit for amplifying a radio frequency (RF) signal, the RF signal comprising an amplitude modulated carrier having an amplitude modulation bandwidth, comprising:

a transistor having an input for receiving the RF signal[, an output, and a common element];

a direct current (DC) bias voltage source; [and]

a biasing circuit, the biasing circuit comprising:

an active element having an input connected to the DC bias voltage source and an output, wherein during its operation the active element [providing]maintains a relatively low output impedance over a bandwidth comparable to the amplitude modulation bandwidth of the RF signal[,]; and

a resistor having an input connected to the active element output and an output connected to the transistor input, such that the DC bias voltage source provides a fixed DC voltage at the resistor input, regardless of voltage fluctuations of the RF signal received at the transistor.

13. (Amended) A wireless communication device comprising an amplifier circuit for amplifying a radio frequency (RF) signal, the RF signal comprising an amplitude modulated carrier having an amplitude modulation bandwidth, the amplifier circuit comprising:

a transistor having an input for receiving the RF signal[, an output, and a common element];

a direct current (DC) bias voltage source; [and]

a biasing circuit, the biasing circuit comprising:

an active element having an input connected to the DC bias voltage source and an output, wherein during its operation the active element [providing]maintains a relatively low output impedance over a bandwidth comparable to the amplitude modulation bandwidth of the RF signal[,]; and

a resistor having an input connected to the active element output and an output connected to the transistor input, such that the DC bias voltage source provides a fixed DC voltage at the resistor input, regardless of voltage fluctuations of the RF signal received at the transistor.

18. (Amended) A gate bias circuit for biasing a gate of a field effect transistor used for amplifying a radio frequency (RF) signal, the RF signal comprising an amplitude modulated carrier having an amplitude modulation bandwidth, the gate biasing circuit comprising:

an active element having an input, an output and an operational amplifier circuit coupled to the output of the active element, wherein during its operation the operational amplifier [having]maintains a relatively low output impedance over a bandwidth comparable to the amplitude modulation bandwidth; and

a resistor having an input connected to the active element output, wherein a direct current (DC) bias voltage applied at the active element input produces a fixed DC voltage at the resistor input.